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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/500,716	07/06/2004	Alexander David Scott Elin	120299	7195
25944 7590 12/13/2012 OLIFF & BERRIDGE, PLC P.O. BOX 320850 ALEXANDRIA, VA 22320-4850				
EXAMINER HEINRICH, SAMUEL M				
ART UNIT 3742		PAPER NUMBER		
NOTIFICATION DATE 12/13/2012		DELIVERY MODE ELECTRONIC		

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5 RECORD OF ORAL HEARING
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7 UNITED STATES PATENT AND TRADEMARK OFFICE
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10 BEFORE THE PATENT TRIAL
11 AND APPEAL BOARD
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14 *Ex parte* ALEXANDER DAVID SCOTT ELLIN and
15 JAMES REYNOLDS HENSHAW
16
17

18 Appeal 2010-009287
19 Application 10/500,716
20 Technology Center 3700
21
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23 Oral Hearing Held: November 6, 2012
24
25

26 Before STEVEN D. A. McCARTHY, GAY A. SPAHN, and
27 JOHN W. MORRISON, *Administrative Patent Judges*.
28

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38 The above-entitled matter came on for hearing on Tuesday,
39 November 6, 2012, commencing at 1:53 p.m., at the United States Patent

1 and Trademark Office, 600 Dulany Street, Alexandria, Virginia, before
2 Diane Humke.

3 THE USHER: Calendar No. 45, Appeal No. 2010-009287, Mr.
4 Schulte.

5 JUDGE McCARTHY: Good afternoon, Mr. Schulte. We have had
6 the opportunity to review the record. We're familiar with the technology,
7 and you have 20 minutes when you're ready to begin.

8 MR. SCHULTE: Okay. Thank you, Your Honor. Well, good
9 morning, Your Honors. My name is Scott Schulte with Oliff & Berridge.
10 I'd first like to introduce and provide a quick overview of this case. This
11 case is dealing with metrological scales. More specifically to that is
12 providing precision marks on metrological scales, and more specific to that
13 is a method and apparatus to place precision marks on a metrological scale
14 by using ultra-short output pulses such as the scale markings that are formed
15 by laser ablation on the scale substrate in which a molten state is omitted.

16 Three things I'd like to emphasize in the last two paragraphs of
17 Claims 1 and 19 again is the use of ultra-short pulses, output pulses, which
18 are approximately 4 picoseconds, as discussed in our Specification, the fact
19 that we use laser ablation, in effect that the molten stage is omitted.

20 Now the reason we're doing this is because the inventors have
21 discovered a problem in that when you have these ultra precise marks on a
22 metrological scale, that you were introducing heat with the laser. That heat
23 will create some kind of buckling, which will affect the accuracy of your
24 precision marks on the metrological scale.

25

1 What they found out in their solution for this is the fact that if you try
2 to avoid introducing heat or for this case using ultra-short pulses, you can
3 cut down the amount of heat. You can avoid or even pretty much remove it,
4 avoid any kind of buckling and have a more accurate metrological scale.

5 JUDGE McCARTHY: Counsel, is the Appellant claiming that
6 they've discovered the problem of this buckling in making these
7 metrological marks?

8 MR. SCHULTE: Yes. Yes, Your Honor. They've come up with this
9 problem as far as performing these precision marks on metrological scales.
10 They're the first ones to identify this problem as far as the prior art is
11 discussed later on. But as far as I know, they're the first ones, yes, Your
12 Honor, to come up with this problem and to provide a solution.

13 JUDGE McCARTHY: And the buckling that you talked about,
14 would that be something that would result from the diffusion of heat from
15 the ablation site into the surrounding metal?

16 MR. SCHULTE: Well, that would be created by just creating heat
17 from the laser. Obviously the laser, when you're doing laser ablation, you're
18 simply removing material. When you're providing a longer pulse length,
19 you're using maybe a different procedure like melting, for example, in the
20 '937 reference, where you're actually introducing heat. So, if you have a
21 long pulse or if something pulses a little too long, you're going to create
22 heat buildup, a little bit of buckling. And again, these are very precise
23 precision marks, so the slightest bit of buckling is going to affect the
24 accuracy of your scale.

1 JUDGE McCARTHY: But doesn't the Ne'ev reference teach that a
2 short pulse will result in heat being either evaporated or expelled away with
3 the material and therefore that spreading out and affecting the, in that case
4 surrounding tissue, in this case surrounding material?

5 MR. SCHULTE: Well, I'll get to Neev, Your Honor. But what Neev
6 is teaching is using ultra-short pulses, and that's why the examiner's applied
7 that reference. But remember, Neev is being used for tissue, for laser eye
8 surgery, which as hopefully appreciated is not the same thing as a
9 metrological scale, has its own set of problems, its own set of concerns
10 because again you're dealing with tissue above a human eyeball, whereas
11 we're dealing with precision marks on a metrological scale. And we don't
12 believe that one skilled in the art would look at Neev and say, all right, for
13 their purposes of trying to avoid say melting of the tissue or damaging the
14 tissue of an eye, would not have -- again, ultra-short pulses serves their
15 purpose. But again, we believe we're the only ones who have come up with
16 this procedure and apparatus in order to form precision marks on a
17 metrological scale.

18 So going on to the rejection, obviously rejection of independent
19 Claims 1 and 19 under 35 U.S.C. § 138 over Applicant's submitted prior art
20 in view of a German reference, which I'll simply refer to as the '937
21 reference, and Neev. And "Neev," it's N-E-E-V.

22 Now the Examiner in the formal rejection has admitted that our
23 Applicant submitted prior art, which is two art -- prior art references at the
24 bottom of page 1 and the top of page 2 of our bridge section -- do not
25 disclose forming a scale by laser ablation. And that's why the Examiner is

1 relying on the German reference, the '937 reference, for the use of a laser to
2 form scale markings and then using Neev to use ultra-short pulses and to
3 argue that it was obvious to use ultra-short pulses from Neev in the German
4 reference.

5 But we don't agree with that combination of '937 and Neev, and we
6 think it's unreasonableness and lacks any kind of reasonable rationale
7 because we believe they're absolutely completely different from each other
8 and inconsistent with each other, and that's why we argue in our briefs that
9 the '937 teaches away from modification and that the Neev reference is
10 actually non-analogous. And again, we take the general position that it's
11 just so outrageous that no one would combine it, nobody would consider
12 using Neev's ultra-short pulses to reduce heating of an eyeball to counter or
13 to use in place -- substitute Neev's -- the '937's teaching on melting to
14 achieve areas of roughness of a polished surface or of a smooth surface and
15 that we have a position only -- and again also argue in our briefs that
16 somebody could only have used impermissible hindsight in order to suggest
17 such a modification. And again, it's the only thing we believe that is sort of
18 driving the Examiner's objection is again using hindsight.

19 I know before this oral hearing we looked up two recent 2012
20 decisions, one from the Federal Circuit, one actually from the Board of
21 Appeals, supporting the proposition that hindsight reasoning is still alive
22 and well. Again, I think the Board decision made the proposition that if the
23 Examiner's combination would not have been but for having the benefit of
24 Appellant's claims to use as a guide, the Examiner could not have made that
25 rejection. Therefore, it's improper hindsight.

1 And actually, the two 2012 cites, they're not in the briefs because
2 again they're within the last -- one, the Federal Circuit, is in May 2012, and
3 the Board is July 2012. But just again to raise the point that hindsight is
4 still alive and well.

5 Now first I just want to do a really quick review of Applicant's prior
6 art, which again is the two references, a U.S. reference and a Japanese
7 reference on the bottom of page 1 and the top of page 2 of our application.

8 JUDGE McCARTHY: Counsel, doesn't the specification also refer to
9 two mechanisms used to remove metal, namely one being using pulses
10 longer than ultra-short pulses and also talking about the use of ultra-short
11 pulses to ablate metal?

12 MR. SCHULTE: We talk about two different known laser ablation
13 techniques, one ultra-short pulses and something that's higher than ultra-
14 short pulses. But we're the only ones that ever came up with the possibility
15 of actually using ultra-short pulses for metrological scales, and we're the
16 only ones that have come up with that proposition. Again, we're also the
17 only ones who came up with identifying the problem of actually using
18 pulses that are actually too long.

19 And again, reading through the Examiner's response and the
20 Examiner's answer, again the Examiner is not relying on that reasoning to
21 reject the claims. The Examiner moves on and explains why it would have
22 been obvious to modify the '937 reference in view of Neev.

23 Now again our Applicant's admitted prior art, again the two
24 references -- if you read the bridge discussion and read the references
25 themselves, the references fail to provide any disclosure or suggestion with

1 regard to using a pulse laser that generates short pulses or to supply the
2 process by which the marks are formed, and therefore that's why the
3 Examiner agreed that again the references fail to disclose laser ablation,
4 ultra-short pulses or the fact that the molten stage is omitted. And that's
5 why he moves to the combination of saying why it would have been obvious
6 to modify the '937 reference and also with Neev, which we again disagree
7 with.

8 First to explain the '937 reference, the '937 reference uses pulses that
9 are approximately 20 nanoseconds in order to melt the top surface of the tag
10 and then to solidify the metal in order to create the solidified melt. So
11 again, they want to use a pulse that's 20 nanoseconds, which if you do the
12 math is 5,000 times greater than an ultra-short pulse, which is approximately
13 4 picoseconds.

14 We should appreciate a nanosecond is 1,000 times greater than a
15 picosecond, so they've got it about 5,000 times greater. And they don't want
16 to use laser ablation. They want to use melting. And the reason they want
17 to melt -- again, they want to melt, so they seek melting in order to have a
18 different roughness than the ceramic polished regions and thus have
19 different reflectivity.

20 This allows optically contrasting markings to be formed on a polished
21 metallic surface. If you don't have melt, you can't -- it's our position that
22 you cannot achieve melt with using ultra-short pulses, and thus you cannot
23 achieve the roughness which they seek in order to have their contrasting
24 markings. Again, using ultra-short pulses would not achieve that reduced
25 reflectivity.

1 Again, they want roughness, which again is why they use 20
2 nanoseconds and have the solidified melt.

3 JUDGE McCARTHY: Counsel, the Examiner referred to a passage
4 that appears at the top of page 4 of the official translation.

5 MR. SCHULTE: Yes, Your Honor.

6 JUDGE McCARTHY: It says, "[i]n order to prevent energy
7 dissipation from the processing area during the duration of the laser pulse,
8 pulses of a clearly shorter duration can be used."

9 MR. SCHULTE: Yes, Your Honor.

10 JUDGE McCARTHY: What's your understanding of what's being
11 said in that sentence?

12 MR. SCHULTE: You can use, for example, 2 nanoseconds, which is
13 10 times less than the 20, or use probably .2. But it's unreasonable to go as
14 far as .004 nanoseconds or 4 picoseconds of, i.e., ultra-short pulses because
15 if you read in the context of the entire disclosure, they want melting.

16 I'm glad you bring it up because I was going to bring it up later, is the
17 fact that if you read the sentence beforehand, before that very sentence, they
18 talk about melt. And hopefully you're looking at the translation provided
19 by the Patent Office. If you look at the sentence immediately afterwards,
20 again they're talking about melting.

21 So, if you're going to use a pulse of a clearly shorter duration, it's got
22 to be long enough still, in our opinion, to get melting to occur, which cannot
23 occur with ultra-short pulses. Again, using ultra-short pulses avoids the
24 introduction of heat into the material. If you cut down or remove the
25 amount of heat going into material, melting is no longer occurring. You're

1 not going to get the roughness that they seek.

2 So it is our opinion that -- and again, 20 nanoseconds is 5,000 times
3 greater than 4 picoseconds. So, if you read that sentence, pulses of clearly
4 short duration can be used, yes. However, they're clearly not talking about
5 ultra-short pulses. And anything you're using has to be sufficiently long
6 enough to have melting in order to get this roughness, which again is not
7 going to get you ultra-short pulses. That's why we believe that's
8 unreasonable that once again you're looking at Neev and deciding to use
9 ultra-short pulses.

10 Your roughness doesn't occur, and therefore your roughness doesn't
11 occur and your melting doesn't occur. And again, you're going away from
12 what the '937 reference is trying to achieve because again, because '937
13 seeks a melting effect, one of skill in the art reading '937 would have
14 actually been led away from using ultra-short pulses in which the molten
15 state is omitted, as we recite in Claims 1 and 19.

16 Again, they've got the solidification melt. We're using laser ablation.
17 It's two different processes, which again using pulses of a clearly shorter
18 duration, it doesn't indicate you'll use a different technique. Again, you've
19 still got the solidified melt.

20 JUDGE McCARTHY: Why wouldn't it be obvious simply to use
21 laser ablation instead of laser melting in order to get surface roughness onto
22 what the official translation calls the "tag surface" or "tag substrate?"

23 MR. SCHULTE: Let me answer in two parts. The reason why they
24 didn't consider it is because, one, I don't think -- '937 doesn't provide any
25 disclosure or suggestion with regards to any kind of buckling or problems

1 associated with heat-up or problems associated with the scale being a little
2 off if you introduce too much heat into the substrate. We're the only ones
3 who came up with it, and that's why we don't believe that it would have
4 been obvious for somebody to again use ultra-short pulses, change the
5 procedure and avoid the roughness.

6 JUDGE McCARTHY: Why shouldn't the German reference be
7 concerned about preventing energy dissipation from the processing area?

8 MR. SCHULTE: Well, they're talking about preventing the energy
9 dissipation from the processing side. They're worried about having their
10 laser on for too long of a period of time because the longer it is, the more
11 possibility of heat being released. So they want to be able to have a shorter
12 pulse so they can focus their heat going into the substrate.

13 But again, it's still got to be long enough to have that roughness, to
14 have that melt. And again, we've argued the fact that you wouldn't have that
15 roughness if you don't use short pulses. I'd also point out the fact that the
16 Examiner's never established the fact that we have ultra-short pulses, that
17 you would have a roughness. Our contention is that you wouldn't have that
18 roughness because laser ablation, you're just simply removing material.
19 And again, there is nothing to indicate that you'd have that roughness, you'd
20 have that melting effect if you use ultra-short pulses.

21 We don't believe it would occur. And again, for the obvious reasons
22 I've mentioned before, you want to have a solidification melt. Using ultra-
23 short pulses, you no longer would be able to obtain the solidification melt
24 because again you're taking away heat from the substrate by using ultra-
25 short pulses.

1 So again, we don't believe there is any reasonable rationale to
2 consider Neev, which uses ultra-short pulse for laser eye surgery and uses
3 laser ablation techniques. We do not believe they're compatible with the
4 '937's teaching of a melting technique. We again talked about what is
5 meant by pulses of a clearly short duration that can be used. And again, I'll
6 just summarize we have a different technique, laser ablation. They have the
7 solidification melt.

8 We're using ultra-short pulses. They're using something that's 5,000
9 times greater. So even if you want to say something uses pulses that are
10 clearly shorter, 5,000 I don't believe in the context of the '937 reference,
11 someone skilled in the art would have gone that far. And again, we wanted
12 to avoid introducing heat. They want to have a melt, so obviously they want
13 to have a certain amount of heat in their substrate. So for those above
14 reasons, we believe that the rejection should be reversed. Are there any
15 more questions?

16 JUDGE McCARTHY: I'm still a little hesitant about your argument
17 that Ne'ev could not be combined with the German reference and the
18 admitted prior art. In particular, it appears that Ne'ev is teaching that if you
19 use the ultra-short pulse you do get most of the heat dissipated out of the
20 material. Number one, since ultra-short pulses were known, why it wouldn't
21 simply be substituting one workable method for another to roughen your tag
22 substrate with ultra-short pulses and an ablative mechanism?

23 MR. SCHULTE: Well, number one, we don't think it's obvious for
24 several reasons. One, we're the only ones that came up with the problem
25 that presented itself for metrological scales. Two, Neev was laser eye

1 surgery. Obviously laser eye surgery is going to have their own problems.
2 And again, if you looked at Neev, we think if one skilled in the art had Neev
3 in their hand and looked at the '937 reference, they would never have
4 thought about using ultra-short pulses, again because of all of the things that
5 the '937 reference is trying to achieve.

6 JUDGE McCARTHY: Well, I'm looking -- the Examiner pointed out
7 in column 1 that Neuv is talking about -- where is it -- removing either
8 material or biological tissue. Furthermore, there are references throughout
9 the Background of the Invention to systems that were used either in ablating
10 biological tissue or materials or semiconductors. And I'm wondering, aren't
11 we talking about basically the same broad field here between ablation of
12 tissue and ablation of industrial materials?

13 MR. SCHULTE: I don't think we are, Your Honor, because again, if
14 you look at Neev, they talk about, I think going up to one -- I think one
15 whole second for a laser pulse. But when they talk about using ultra-short
16 pulses, their ultra-short pulses are specific to laser eye surgery. And Neev
17 doesn't mention metrological scales, doesn't provide any discussion about
18 trying to put precision marks on metrological scales, and again the problem
19 presented of possible buckling, and again for these very precise markings
20 being able to -- again, any kind of buckling is going to influence your
21 markings, because again for something this small, any kind of buckling is
22 going to have a significant effect.

23 I know that also we think it's just purely hindsight that somebody
24 would look at Neev and decide to use ultra-short pulses. I know I again
25 mention hindsight as being alive and well. Another Federal Circuit case,

1 which is Mintz v. Dietz, 639 F. 3d 1372, actually looking at page 1379,
2 mentioned the fact that even though something may be simple -- and I don't
3 want to admit this is simple -- but again, if it seems simple after reading --
4 actually it would probably be better just to read the case.

5 "Indeed, whether an invention is less technologically complex, a need
6 for *Graham* findings can be important to ward against falling into the
7 forbidden use of hindsight. Simply because the technology can be easily
8 understood does not mean that it will satisfy the legal standard of
9 obviousness. In fact, objective consideration of simple technology is often
10 the most difficult because, once the problem and solution appear together in
11 the patent disclosure" -- which seems to be, I think, issues being brought up
12 right now in this hearing -- "the advance seems self-evident. Instead, the
13 proper analysis requires a form of amnesia that 'forgets' the invention and
14 analyzes the prior art in understanding the problem at the date of invention."

15 So again, looking at the date of invention, from our Specification,
16 we're the only one coming up with the problem that then was solved. '937
17 is not talking about using ultra-short pulses for their substrate. They were
18 talking about the solidification melt. And again, Neev, although it discloses
19 ultra-short pulses, they're using it for laser eye surgery, so obviously for us
20 it becomes clear that they're not looking at the problem presented and
21 solved or considering using ultra-short pulses for metrological scales in
22 order to correct the accuracy of these precision marks.

23 JUDGE McCARTHY: But in order to find obviousness, do we have
24 to find that Ne'ev teaches using ultra-short pulses for the specific purpose of
25 improving the accuracy of metrological markings?

1 MR. SCHULTE: I believe you -- well, again I'm saying hindsight is
2 alive and well. But I think for obviousness, something has got to be
3 obvious to try or reasonably predictable for somebody to actually look at the
4 '937 reference and try to modify it by using ultra-short pulses. I think if one
5 skilled in the art was to look at '937 and using common sense would not
6 have considered using ultra-short pulses, I think again because '937, they
7 want to have a different roughness. They want to have their solidification
8 melt. They're talking about something that's 5,000 times greater, which at
9 20 nanoseconds is greater than us.

10 So again, I don't think one skilled in the art when looking at the two
11 references would have considered it obvious to try or reasonably predictable
12 to combine those references. I cannot find any -- that it's reasonably
13 practical or rational that one skilled in the art would look at these two
14 references and say, "hey, let's combine them." Again, I think this is being
15 driven on hindsight by the Examiner. And again, the '937 reference is
16 trying to accomplish a different purpose. They want solidification, they
17 wanted roughness. They wanted to be able to distinguish their markings
18 clearly, which they can't obtain. And again, that's something they're seeking
19 out, that they're not being able to obtain that by using ultra-short pulses. So
20 the question is whether or not it would still render -- would the '937
21 reference still be workable? Could it still operate?

22 JUDGE McCARTHY: What is it about the '937 reference that
23 requires melting as opposed to ablation?

24 MR. SCHULTE: Well, the '937 reference wants roughness and the
25 way they achieve that is by melting. So to step back again, how do you

1 achieve your roughness? Again, the only solution they have is melting,
2 which will help according to them achieve your roughness. If you use --

3 JUDGE McCARTHY: But wouldn't simply ablating a series of
4 marks cause roughness in the so-called tag substrate?

5 MR. SCHULTE: I don't think so, Your Honor, because those
6 ablations are just simply removing material. If you're simply removing
7 material, you're going to have a slight change in depth on the scale by just
8 removing material. But as far as roughness is concerned, I don't think that
9 they would actually achieve the roughness they're seeking to achieve. I
10 think you'd have some limitations with the laser ablation, ultra-short pulses.

11 But again, I don't think you would get to the roughness that they are
12 seeking to achieve. And again, I don't think somebody looking at the '937
13 reference would think -- and again, it's a different technique -- would have
14 thought about using laser ablation. I think they're using their solidification
15 melt for a reason. They want to have enough heat. They want to melt. That
16 is for them a sufficient amount of roughness.

17 JUDGE McCARTHY: I have one more question. As far as
18 recognizing the problem, is the argument that they would not recognize the
19 problem in your briefs somewhere?

20 MR. SCHULTE: Yes, Your Honor. We're the only ones to have
21 recognized our problem of actually having --

22 JUDGE McCARTHY: Is that in the briefs or the Specification
23 somewhere?

24 MR. SCHULTE: It's in the Specification, page 1 of the Specification,
25 second paragraph, and in the briefs, I'd have to look that up, but I'm very

1 confident that we've argued that point. And again, we're the only ones, we
2 believe, to come up with the fact that you're going to have this kind of
3 buckling with these precise metrological scales. I don't believe the '937
4 presents that problem. I don't think the Neuv presents that problem. And
5 obviously we don't believe that Neev provides the way they operate. Again
6 I think they feed right into that problem, just too much heat generated when
7 you're creating these precise markings.

8 JUDGE McCARTHY: Do you have any more questions, John?
9 Judge Morrison?

10 JUDGE MORRISON: Yes. Maybe would the power of the Neev
11 reference -- is there a difference in that the technology that's involved where
12 maybe ablation wasn't possible with the previously disclosed lasers? I
13 mean, I know we talk about the fluence values of the laser. Is that an
14 evolution of technology that allows you to move from melting into ablation,
15 or could you use the laser in the German reference and just do micro-, or as
16 you call "ultra-short," pulses and get ablation using that technology?

17 MR. SCHULTE: Can you repeat that one more time? I think I
18 missed part. Can you repeat that question one more time?

19 JUDGE MORRISON: Yes. I'm asking if there's any kind of
20 difference between the technology in the German reference and your
21 technology where even ultra-short pulses using the prior art would not
22 produce ablation because of power levels available.

23 MR. SCHULTE: I don't know about the standard of art. I know
24 obviously Neev is a prior art reference. They're using ultra-short pulses for
25 laser eye surgery, which appears to make sense given the fact that you don't

1 want a hot laser. I don't believe anybody has considered doing this for
2 metrological scales. As far as the references, there is no discussion about
3 using this for metrological scales.

4 And again, from reading the Federal Circuit case, I don't really want
5 to make it sound like it's simple. I don't want to make it sound like -- again,
6 after reading our Specification, a lot of these issues make sense because
7 again that's purely hindsight. I mean, you sort of have to step back and look
8 at what are the prior art references disclosing and what are the prior art
9 references suggesting in themselves, and again, if you look at laser eye
10 surgery, ultra-short pulses make sense. But applying that technology to
11 metrological scales, I don't think that would have been obvious as far as
12 what's disclosed in the reference.

13 And again, especially looking at Neev, I think Neev wants these
14 longer pulses. They want 20 nanoseconds or something that's shorter,
15 which again it can be something like .2, maybe 100 times less, but again
16 something that's not 5,000 times less. That's a rather significant jump to go
17 from 20 to .004. It's a significant leap.

18 JUDGE MORRISON: I think that's all.

19 JUDGE McCARTHY: Thank you for your time, counsel. We will
20 take the appeal under advisement.

21 MR. SCHULTE: Thank you, Your Honor.

22 (Whereupon, at 2:23 p.m., the proceedings were concluded.)